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(54) Title: CLP-PROTEASE AS TARGET FOR HERBICIDES

(57) Abstract: The present invention relates to Clp-protease, which, when absent, brings about reduced growth and chlorotic leaves as target for herbicides. For this purpose, novel nucleic acid sequences encompassing SEQ ID NO:3, SEQ ID NO:11 and SEQ ID NO: 17 and functional equivalents of SEQ ID NO:3, SEQ ID NO:11 and SEQ ID NO: 17 are provided. Moreover, the present invention relates to the use of Clp-protease in a method for identifying compounds with herbicidal or growth-regulatory activity, and to the use of the compounds identified by this method as herbicides or growth regulators.

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## A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12Q C07K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBL, PAJ, WPI Data, EMBASE, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online! XP002279219 retrieved from EBI Database accession no. AB022327 sequence alignment abstract -&amp; DATABASE UNIPROT 'Online! XP002281264 retrieved from EBI Database accession no. Q9XJ36 abstract -&amp; NAKABAYASHI KAZUMI ET AL: "Identification of clp genes expressed in senescing Arabidopsis leaves" PLANT AND CELL PHYSIOLOGY, vol. 40, no. 5, May 1999 (1999-05), pages 504-514, XP009030466 ISSN: 0032-0781</p> <p>----- -/-</p>	<p>3-9, 19, 20</p>

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL 'Online!  XP002279220  retrieved from EBI  Database accession no. AB022330  sequence alignment  abstract  -&amp; DATABASE UNIPROT 'Online!  XP002281265  retrieved from EBI  Database accession no. Q9XJ35  abstract  -&amp; NAKABAYASHI KAZUMI ET AL:  "Identification of clp genes expressed in  senescing Arabidopsis leaves" PLANT AND  CELL PHYSIOLOGY,  vol. 40, no. 5, May 1999 (1999-05), pages  504-514, XP009030466</p>	3-9, 19, 20
X	<p>DATABASE EMBL 'Online!  XP002279221  retrieved from EBI  Database accession no. AK118523  sequence alignment  abstract  -&amp; DATABASE UNIPROT 'Online!  XP002281266  retrieved from EBI  Database accession no. Q9FN42  abstract  -&amp; KOTANI ET AL.: "Structural analysis of  Arabidopsis thaliana chromosome 5.II.  Sequence features of the regions...." DNA  RES.,  vol. 4, 1997, pages 291-300, XP008017317</p>	3-9, 19, 20
X	<p>WO 03/008440 A (PATTON DAVID ANDREW  ;SYNGENTA PARTICIPATIONS AG (CH); ASHBY  CARL S) 30 January 2003 (2003-01-30)  table 5, gene 62837, sequences 81-82 and  the whole document</p>	1, 2, 10-20
X	<p>HEINE, HAROLD W. AND BROOKER, ANNE C.:  "The isomerization of aziridine  derivatives. VI. The rearrangement of some  2-(1-Aziridinyl)quinoxalines"  JOURNAL OF ORGANIC CHEMISTRY,  vol. 27, 1962, pages 2943-2944,  XP002328507  p.2944, compound Ia.</p>	26

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PCT/EP2004/013555

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE REGISTRY 'Online! 29 May 2001 (2001-05-29), XP002328508 retrieved from STN Database accession no. RN-338775-59-0 abstract</p>	26
Y	<p>HUANG C ET AL: "The Chlamydomonas chloroplast clpP gene contains translated large insertion sequences and is essential for cell growth." MOLECULAR &amp; GENERAL GENETICS: MGG. GERMANY 25 JUL 1994, vol. 244, no. 2, 25 July 1994 (1994-07-25), pages 151-159, XP001181317 ISSN: 0026-8925 the whole document</p>	1,2, 10-20
Y	<p>SHIKANAI TOSHIHARU ET AL: "The chloroplast clpP gene, encoding a proteolytic subunit of ATP-dependent protease, is indispensable for chloroplast development in tobacco" PLANT AND CELL PHYSIOLOGY, vol. 42, no. 3, March 2001 (2001-03), pages 264-273, XP009030482 ISSN: 0032-0781 the whole document</p>	1,2, 10-20
Y	<p>CLARKE ADRIAN K ET AL: "Inactivation of the clpP1 gene for the proteolytic subunit of the ATP-dependent Clp protease in the cyanobacterium Synechococcus limits growth and light acclimation" PLANT MOLECULAR BIOLOGY, vol. 37, no. 5, July 1998 (1998-07), pages 791-801, XP009030486 ISSN: 0167-4412 the whole document</p>	1,2, 10-20
A	<p>ADAM ZACH ET AL: "Chloroplast and mitochondrial proteases in Arabidopsis. A proposed nomenclature" PLANT PHYSIOLOGY (ROCKVILLE), vol. 125, no. 4, April 2001 (2001-04), pages 1912-1918, XP002279218 ISSN: 0032-0889 p.1912, right-hand column, second paragraph and p. 1913, right-hand column, the "Clp proteases" section</p>	1-20

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 03008440	A	30-01-2003	WO 03008440 A2	30-01-2003

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